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ABSTRACT

The purpose of this study was to investigate the relationship between students' ability to recover deep structures, as measured by the Sentence Comprehension Subtest (SCS) of the SRA Reading Index, and their reading comprehension as measured by the Reading Progress Scale (RPS). All 11th grade students in Hillsborough High School, Belle Mead, New Jersey, were administered the RPS and SCS. The results were inadequate to answer the questions posed in the study. The two tests were then administered to a group of 100 7th graders in the Hillsborough School. Means, standard deviations, and intercorrelations were computed for the RPS, the SCS, and the SRA Reading Index. All correlations were significant at the .01 level. A positive correlation between deep structure recovery and reading comprehension was established on the basis of these tests. The results indicated that there is a relationship between a student's functional grammatical knowledge and his reading comprehension. (WR)

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DEEP STRUCTURE AS A PART OF PEADING COMPREHENSION

A THESIS

SUBMITTED TO THE FACULTY

OF THE GRADUATE SCHOOL OF EDUCATION

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BY

MARIANNE CLIFFORD REYNOLDS

IN PARTIAL FULFILLMENT OF THE

REQUIREMENTS FOR THE DEGREE

OF

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CHAPTER 1

INTRODUCTION

Traditionally, English teachers have been expected to provide their students with a firm foundation in reading, writing, public speaking, and great works of literature. In recent years, due to a variety of factors including an emphasis on content rather than form, an acceptance of variations of "correctness" in oral and written expression, and an eagerness to foster students' creativity, the high school curriculum has been moving away from areas such as formal grammar. The transformational grammarians and linguistic theorists have also had an effect on attitudes toward traditional grammar. They seem to have been successful in persuading high school English teachers to question the validity of teaching traditional grammar, but have not been nearly as successful in establishing transformational grammar in its place. A 1968 study of 158 high schools in 45 states revealed that a substantial majority of these schools had virtually abandoned the formal and systematic study of English (Long, 1970).

Linguists have professed the idea that grammatical rules cannot be taught to produce effective or "correct"

speakers, readers, and writers; rather these rules are learned intuitively as a result of exposure to oral and written language patterns. At the same time that the limitations of formal language instruction are being realized, the complexities of language and its close relationship with other areas is also being noted. It is generally acknowledged that a child's language fluency is directly related to his reading proficiency, but it is more difficult to pinpoint the connection between specific language skills and reading comprehension. Some of the concepts which have emerged through the study of transformational grammar can be used to arrive at a better understanding of the relationship between the structure of language and areas such as speech acquisition, memory and learning, and reading comprehension. If we are better able to apply the study of language to these areas, perhaps we will see a modified and more meaningful approach to grammar and language instruction instituted.

An important concept of the transformational grammar theory (Chomsky, 1965) is that a reader or listener must be able to recover the deep structure or meaning of a sentence through an awareness of the relationship between the words as well as the individual meanings of the words. This can also be applied to reading since true comprehension requires an understanding of verbal relationships as

well as familiarity with vocabulary. It has been suggested that style as well as word difficulty be taken into account when choosing reading materials for children. Instructional materials which are chosen solely on the basis of vocabulary underestimate and may stunt a child's language and reading facility (Moir, 1970). One of the reasons that has been suggested as to why children can read words in context that they cannot recognize in lists is the use of language cues such as the patterns of word order, function words and contextual meaning of prior and subsequent language elements (Goodman, 1964). The fact that by the age of four or five years, most children have full control of practically all of the basic grammatical signals of their language (Fries, 1962) should certainly be taken into account in beginning reading programs.

The concept of deep structure should also be considered in relation to language and reading programs designed for high school students. If a direct relationship between reading comprehension and structural awareness can be established, a new approach to teaching language skills and refining the comprehension skills may follow.

Statement of the Problem

The benefits of teaching grammar to secondary school students is frequently in question. The possibility of a relationship between a student's knowledge of grammar and his reading comprehension offers another approach to the justification of teaching grammar, and perhaps a means of improving a student's reading comprehension ability. Since this idea covers a very broad area, this study will address itself to the relationship between a specific grammatical or linguistic ability and the reading comprehension process. Specifically, it will deal with a student's ability to recover deep structure and his reading comprehension.

The following questions will be investigated:

1. Is there a significant positive correlation between a student's score on the Sentence Comprehension Subtest of the SRA Reading Index and his score on Carver's Reading Progress Scale?

2. Is there a difference between ability groups students have been placed in for their English classes according to correlations between scores?

3. Are there differences in the correlations between Sentence Comprehension scores and Reading Progress Scale scores for the better readers, and the poorer readers?

Definition of Terms

Ability to recover deep structure. For the purposes of this study, a student's ability to recover deep structure will be measured by his score on the Sentence Comprehension Subtest of the SRA Reading Index.

Reading comprehension. For the purposes of this study, a student's reading comprehension will be measured by his score on Carver's Reading Progress Scale.

Cloze technique. This technique is used for testing, teaching, and determining readability. It consists of deleting every nth word from a particular passage and replacing it with a uniform size blank space. The student is asked to fill in the blank with the word he thinks has been deleted (Taylor, 1953). Carver's Reading Progress Scale uses a modified cloze technique in that the student chooses between two given responses when determining the deleted word.

Importance of the Study

The question of the relationship between grammatical skills and reading comprehension has received some attention in terms of elementary school children (Simons, 1970; Stoodt, 1970), but little investigation has been concerned with the relationship as it affects secondary

students. It has been shown that low reading performance college freshmen who score higher on comprehension than vocabulary make use of semantic and syntactic structure in oral reading (Ohaver, 1971).

There has been a steadily decreasing amount of attention devoted to teaching grammar in high school during the last twenty years (Long, 1970). One of the arguments against teaching traditional grammar to older students is that their language patterns have already been established and a knowledge of rules will not affect verbal or written performance at this point. If a direct relationship between functional grammatical skills and reading comprehension can be demonstrated, perhaps another look at the role of grammar for the secondary student would be in order.

Limitations of the Study

The two testing instruments which will be used in this study are designed to determine whether an applicant possesses the necessary reading skills to succeed in a job which involves a minimal amount of reading. The scores on the Reading Progress Scale place students in reading ability categories of grades 1-3, 4-6, 7-9, or 10-12. (Raw scores will be used for the purposes of evaluating data.) For these reasons, a large percentage

of the population (the entire junior class of Hillsborough High School, approximately 40% of which is college bound) will score high on these tests. One advantage of using the Reading Progress Scale and the SRA Reading Index is that the slower students will not find the tests frustrating, and a valid correlation between the two should be attainable.

The Sentence Comprehension section of the SRA Reading Index is a subtest of a reading test, so that a high correlation between it and the Reading Progress Scale is expected, but this will be noted when analyzing the data.

The population used in the study consists of students enrolled in the Hillsborough school district which is located in a rural/suburban middle class community. The socioeconomic status of the subjects is somewhat restrictive in terms of generalizing the results to apply to all secondary students.

It should be noted that this study is concerned with only one aspect of the question of the value of teaching grammar, that of the relationship of a specific grammatical ability to the reading comprehension process. It does not deal with other factors such as the relationship between functional grammatical ability and a student's speaking or writing ability.

There is also a possibility that the two testing instruments are testing a general language ability or verbal I.Q. factor which will result in a greater correlation. Since both of the tests are concerned with the reading process, it is possible that they will be measuring a common factor to a certain extent.

Overview of the Study

In Chapter 2, the past research in the areas of cloze technique, grammatical knowledge and reading comprehension, and linguistic theory which can be applied to reading will be considered. A detailed account of the procedure followed in this study, including a discussion of the testing instruments and population will be found in Chapter 3. The data will be presented and analyzed in Chapter 4 and compared with previous findings. A summary of the study, conclusions which can be drawn, and suggestions for further research will be presented in Chapter 5, followed by a list of references and copies of the tests in the appendix.

CHAPTER 2

SURVEY OF THE LITERATURE

Literature which was concerned with certain aspects of the comprehension process, teaching and testing techniques, with special emphasis on cloze was reviewed. An investigation of linguistic theory and transformational grammar in the area of deep structure, and the connection between this concept and the reading process was also conducted.

Reading Comprehension

The reading comprehension process is a complex one, and much research has been conducted in an effort to accurately define the psychological functions involved and to isolate specific skills which could be utilized in teaching readers to comprehend more efficiently. Many different approaches to this problem have been undertaken and they have been classified in seven different categories: the skills approach, the measurement approach, the readability approach, the introspective approach, and the models approach (Simons, 1970). None of these

approaches has been completely successful in arriving at an accurate explanation of the comprehension process. They have, however, succeeded in pointing out the complex nature of the process and the necessity of taking into consideration certain factors which affect comprehension.

> The goal of all reading is the comprehension of meaning. The initial step in this process is the association of an experience with a given symbol. This is absolutely necessary, but it is the most elemental form of comprehension. Complete meaning is not conveyed by a single word. The good reader learns to interpret words in their contextual setting. He comprehends words as parts of sentences, sentences as part of paragraphs, and paragraphs as part of stories. Meaningful reading includes not only a literal interpretation of an author's words, but also an interpretation of his mood, tone, feeling, and attitude (Dechant, 1970).

We now realize that many factors enter into a child's or an adult's ability to comprehend specific written material, and that word knowledge alone is not the all important area (Allen, 1972). It has been suggested that one of the reasons that children can read words in context that they cannot recognize in lists is the use of language cues such as the patterns of word order, function words, and contextual meanings of prior and subsequent language elements (Goodman, 1964). It has also been demonstrated that there are different levels of word meanings, and an individual's ability

to recognize synonyms may not be a clear indication of word knowledge (Dolch and Leeds, 1953).

Attempts have also been made to determine the difficulty of reading materials and to measure degrees or depth of comprehension on the basis of the amount of time devoted to comprehension. It has been suggested that context effects may be seen in the area of deeper meaning as well as speeded comprehension (Dooling, 1972). It has generally been acknowledged that a reader's comprehension rate will vary with the type of reading material with which he is presented. It is also reasonable to assume that reading comprehension will be affected by the style and the linguistic complexity of the material (Aquino, Mosberg, and Magee, 1969).

One of the fundamental beliefs of those involved in educational research is that knowledge of learning processes is extremely helpful in the development of teaching techniques concerned with these processes. The more information we can gain about the comprehension process and its relation to what we know about language abilities and their development, the better able we will be to develop effective teaching methods which take these processes into account.

Measurement of Reading Comprehension

In addition to the problem of defining the reading comprehension process, it is also difficult to accurately measure a student's comprehension. Traditionally, a student's comprehension has been measured by presenting him with a passage to read followed by a series of multiple choice questions based on the information presented. It is difficult to determine whether such a test is actually measuring reading comprehension or whether it is measuring a student's memory, his ability to understand questions and the choices of answers presented, his test taking skill, his familiarity with the content material presented, or any combination of these (Simons, 1970). Another problem which the traditional multiple choice comprehension task is that the test itself is a reading task, and we cannot be sure whether the test is measuring the difficulty of the passage or the questions, and we receive no information about how difficult each word or phrase or sentence in the passage is (Bormuth, 1969). It has also been pointed out that this type of test is subject to the influence of how much the individual knows about the subject matter presented in the passage prior to the test itself (Bormuth, 1967).

Cloze Technique

A more acceptable method of measuring reading comprehension is the cloze technique, which consists of deleting every nth word from a passage and asking the student to fill in the blank with the appropriate word (Taylor, 1953). It can be used as a teaching or testing technique and also to determine the readability level of certain reading materials. A typical cloze passage will have every fifth word deleted and the exact word is the only acceptable answer. In certain cases, the technique has been varied to suit specific purposes. For example, a particular category of words, such as conjunctions, may be deleted to measure a student's capacity in that particular area. A choice of two words may be offered to the student to fill in the blank to facilitate scoring of tests to be administered to large groups of students. The cloze test differs from a sentence completion test because it deals with contextually interrelated series of blanks, not isolated ones, and it does not deal directly with the meaning of specific words, but with the meaning of larger units (Taylor, 1953).

The cloze test has the advantage of correlating highly with traditional reading tests yet seems to be measuring fewer of the extraneous variables (Bormuth, 1967). A score relationship has been established

between traditional comprehension and cloze tests so that we can apply information about instructional and independent reading levels to cloze tests. Bormuth has established that a 38% cloze score is equivalent to 75% raw or 67% corrected multiple choice score, and a 50% cloze score equivalent to a 90% raw or 87% corrected multiple choice test score (Bormuth, 1967). Another interesting factor which the cloze technique has pointed out is that there is a reading difficulty level at which the reader realizes maximum information gain. Students who score below 37% on a cloze passage have gained little information, but students who use materials which are much easier than 37% acquire only slightly more information than they brought to the passage. It should also be noted, though, that students who score only 37% on a given passage may gain maximum information, but they will also be quite frustrated by the difficulty of the material (Bormuth, 1968). It has also been shown that students who are asked to read sentences with one or more words deleted (as in the cloze procedure) learn more of the material than students who read whole sentences (Anderson, 1971). This can be explained by the fact that students who filled in the blanks were required to comprehend the other words in the sentence in order to produce a meaningful answer.

The cloze procedure has been compared with some well known traditional reading tests: Gates Reading Tests, Gilmore Oral Reading Test, and the Gray Oral Reading Test for children in grades 1-6. It was shown that the cloze test did not differ from the Gilmore at any level or for any subgroup, did not differ significantly from the Gates except in grades 1 and 2, but did differ significantly from the Gray Oral Reading Test (Kirby, 1968).

As a testing device, it asks continuous comprehension questions during the reading time, thus allowing analysis of relative difficulty of different sections of the passage.

> The cloze procedure seems to fit the concept of learning to comprehend by reading phrases and avoiding word by word silent reading of passages. . . . The concepts tend therefore to be fairly well formed and cloze procedure reading comprehension is a measure, not so much of how much the individual can learn from a passage, but of how much he already knows about it when he enters the passage. The reverse is true when we consider the typical reading comprehension selection which consists of a paragraph followed by a series of questions about the paragraph which the individual must answer (Bloomer, 1966).

Bloomer has also investigated a number of studies which compare the cloze technique with other measures of readability, general reading achievement, and those which have compared the results of a cloze test with a comprehension test based on the same reading material.

On the basis of four studies which compare cloze with the Dale-Chall and Flesch formulas, predicted difficulty, judges' rating, and multiple choice comprehension questions, cloze can be used as a reliable estimate of reading difficulty which can be used for rank ordering.

As a measure of general reading achievement, nine of eleven studies arrived at a respectable correlation between cloze and such measures as the Metropolitan Achievement Test--Reading Section, Michigan Vocabulary Profile Test, Dvorak-VanWagenen Diagnostic Examination of Silent Reading Ability. It is also pointed out that cloze is used as a reading comprehension device on the Stanford Achievement Test.

Ten studies which involved a comparison between a cloze measure and traditional comprehension measures based on the same reading materials yielded relatively high correlations. One exception was a study (Friedman, 1964) which showed low correlations when comparing individual scores, as opposed to group scores (Bloomer, 1966).

In addition to the advantages of a cloze test over a multiple choice reading comprehension test which have already been mentioned, the cloze technique is particularly well suited to the purposes of this study. In an attempt to determine the relationship between reading comprehension and ability to recover deep

structure, an effort should be made to insure that the two measurement instruments are not in fact measuring the same thing. In a traditional reading comprehension test, a student is often asked to make inferences or draw conclusions based on the reading passage; a cloze test is concerned only with the material itself. The cloze test also eliminates the possibility of the student choosing the correct answer on the basis of similarity of surface structure, or word or pattern order, between one of the possible answers and the area in the passage where the information can be found. In a case like this, the student's correct answer would not be an indication that he has comprehended the material or the question.

Deep Structure

When we realize that reading comprehension is not merely a function of vocabulary, but involves many more things, including the interrelationships between words in a sentence, we also realize that certain aspects of linguistic theory should be considered in connection with the comprehension process. Children learn to speak their native language in developmental stages and the grammar rules of this language are implicit (Carol Chomsky, 1972). A child may not learn to speak through imitation alone, because he is capable of producing sentences which he has

never heard. The system or set of rules which constitute a language must be intuitively learned because it is not certain that they can be taught by formal instruction (Smith and Goodman, 1971).

A linguist is interested in a speaker's competence (his knowledge of the grammar or system of rules upon which his language is based) but is able to measure only his performance (the way he uses those rules) in much the same way that a reading specialist is interested in the reading comprehension process but can measure only the results of that process. The linguist also believes that there are two levels of language: surface structure which consists of the sounds or written representation of language, and deep structure or meaning. These two levels are related in a complex way through the system of rules that is grammar or syntax (Smith and Goodman, 1971). Chomsky states that the central idea of transformational grammar is that these two levels are distinct, and that the surface structure is determined by repeated application of certain formal operations called grammatical transformations. He also believes that the syntactic component must generate deep and surface structures for each sentence and must interrelate them (Chomsky, 1965).

Although the concept of deep structure began as part of a theory, studies have been conducted which support its existence. The idea of ambiguity, i.e., the fact that some sentences can be interpreted in more than

one way, indicates that the interpreter has gone below the surface structure to arrive at the meaning. An example to illustrate this idea is: What disturbed John was being disregarded by everyone. This can be taken to mean that John was disturbed by the fact that everyone was disregarding him, or that the occurrence that was disturbing John was disregarded by everyone. In this case, the same surface structure can have more than one deep structure. A more common feature of the language is that sentences which have different surface structures can have the same deep structure, i.e. the sentences are paraphrases of each other and have the same meaning. The latter situation is the one we will be concerned with in its relation to reading comprehension.

The phenomenon of deep structure has also received support from the finding that perception is affected by changes in surface and deep structure (Mehler and Carey, 1967) and the relationship between pause variance and syntax in oral reading which reflected an understanding of both deep and surface structures (Brown and Miron, 1971). The effects of deep structure have been demonstrated in the areas of paired associate learning (Davidson and Dollinger, 1960), ambiguity and perception (Mehler, Bever, and Carey, 1967), processing of sentences (Ammon, 1968), and recognition (Wang, 1970).

The Relationship Between Deep Structure and Reading Comprehension

As has been previously stated, the linguists have emphasized the idea that researchers in the field of comprehension must address themselves to grammatical structures such as noun and verb clusters as well as to individual words (Postman and Weingarten, 1966). They should also be aware of the fact that elements which lead a grammatical sequence may consume more time in the comprehension process, but they allow a reduction in time for elements which follow (Weaver and Garrison, 1966). Although we have been aware of the fact that longer sentences are usually more difficult to read, the linguists have suggested that the reason behind the fact is that they consist of longer clauses because several clauses have been consolidated into one, or have undergone more transformations (Hunt, 1970).

When vocabulary and content were held constant, syntactically more complex structures increased reading difficulty for 4th - 12th grade students. Another interesting fact is that students had difficulty with syntactically unfamiliar material which was far below their grade level as well as that which was above their grade level (Smith, 1970). Syntactic structure affected reading comprehension for 1st grade students when they had

been screened on vocabulary, but the effects varied with the mode of presentation, oral reading, silent reading, and listening comprehension (Nurss, 1966). In an attempt to determine the relationship between deep structure recovery and reading comprehension for 5th graders, Simons found that deep structure was the most significant factor affecting reading comprehension when compared with I.Q., word knowledge, and word recognition skills (Simons, 1970).

Some interest has been shown in the area of the relationship between structural awareness and reading comprehension for high school students. In one study intended to determine the relationships between a knowledge of grammatical rules, structural awareness, and reading comprehension, O'Donnell found that awareness of structure is more highly related to reading than a knowledge of traditional grammar is, but the correlation was not high enough to justify teaching grammatical structure as a primary means of developing reading comprehension (O'Donnell, 1962). When a similar study was carried out with a different population, the results failed to produce a significant relationship between a knowledge of grammar and reading ability. A very high correlation between knowledge of grammar rules and awareness of structure indicated that a common factor was being measured. The author also suggested that although mastery of

terminology and rules tends to be accompanied by an ability to recognize structure, it is not necessarily true that knowledge of rules results in this ability (O'Donnell, 1963). Another study was conducted to examine semantic and syntactic cueing by college freshmen classified as slow readers. The students in this group whose comprehension scores were considerably higher than the others were judged to be reading deep structure and producing more miscues when they re-transform to produce the meaning obtained (Ohaver, 1971).

There seems to be sufficient indication that deep structure is a level of language, and that it does play some part in the reading comprehension process. For the purposes of this study, a student's ability to recover deep structure will be measured by his score on the Sentence Comprehension Subtest of the SRA Reading Index. In this test, the students are presented with a sentence and asked to choose which of four other sentences has the same meaning. All of the sentences presented have different surface structures, so in order to answer correctly, the student must at least recover the deep structure of the given sentence and the sentence which has the same meaning. Sentences which are paraphrases of each other have different surface structures and the same deep structure, and a student's ability to recognize this indicates his ability to recover deep structure.

Summary

The reading comprehension process is a difficult one to define and to measure. In seeking to understand the process and isolate specific skills connected with it, it is advisable to take into consideration recent linguistic theories of language since reading and language are so closely related.

The cloze technique seems to offer several advantages over the traditional multiple choice type reading comprehension test. It highly correlates with such measures and appears to be measuring fewer extraneous variables.

The concept of deep structure is an essential element in the theory of transformational grammar. The idea that a reader or listener must go below the surface structure of a sentence in order to arrive at the meaning of the sentence has been accepted, and this realization should also be applied to the reading comprehension process.

Some studies have been conducted which show that there is a relationship between the structure of language and the difficulty of the material and the reader's ability to comprehend it. Studies which were conducted with elementary school children seem to indicate a fairly close relationship between grammatical structure and comprehension, but efforts on the high school level have been less conclusive.

CHAPTER 3

PROCEDURE

The purpose of this study was to examine the relationship between a high school student's ability to recover deep structure and his reading comprehension as measured by a cloze technique. The following questions were asked:

1. Is there a significant positive correlation between a student's score on the Sentence Comprehension Subtest of the SRA Reading Index and his score on Carver's Reading Progress Scale?

2. Is there a difference between ability groups students have been placed in for their English classes according to correlations between scores?

3. Are there differences in the correlations between Sentence Comprehension scores and Reading Progress scores for the better readers, and the poorer readers?

Although both tests were designed to test minimal skills of high school students, an eleventh grade population was chosen over a twelfth grade population, which would have been closer to the target group. The reason for this choice was that extreme reading deficiencies

which might have been discovered during the course of the study would receive attention during the students' senior year. It is unlikely that sufficient remedial attention could have been offered to a high school senior with severe reading deficiencies before his graduation.

Population

Hillsborough High School is in Somerset County New Jersey, and is located in a rural/suburban community. (1970 census figures for Hillsborough Township are recorded as four separate tracts. The following figures represent a compilation of these wherever possible.) The 1970 census figures reveal that the total population of the township is 11,061 and the school enrollment is 808. (The high school enrollment has since increased to approximately 1,000 students.) Two areas of the township report .3% and .1% Negro population and there are three black students in the high school. The average number of years of schooling completed by residents 25 years of age or over is 12.4 and 62.4% of the residents are high school graduates.

The unemployment rate for males 16 years of age or over is approximately 10% and approximately 50% of females over 16 years of age not enrolled in school are employed.

Manufacturing claims the highest number of workers (approximately 40%) followed by professional and technical

(approximately 20%), industry and construction workers (approximately 7%). The working class can be divided into the categories of private wage and salaried workers (approximately 85%), government employees (approximately 10%), and self employed workers (approximately 5%).

Census figures listed the median family income of three of the tracts within the township as $7,600, $3,632, and $3,803. Mean income figures were similarly listed as $17,097, $5,567, and $5,098. The percentage of families below the poverty level ranges from 1.1% in one area of the township to 8.2% in another.

Hillsborough Township is primarily rural, but it is the scene of rapid development. Construction began in 1972 on a Planned Unit Development which is expected to double the population of the township within five years. Many new private housing developments are in the planning or construction stages and will presumably raise the income level. The projected enrollment of Hillsborough High School, built in 1969, reveals that the school will be overcrowded within two years.

The number of students present when the SRA Reading Index and Carver's Reading Progress Scale were administered to eleventh graders in their English classes was 218. The students ranged in age from 16 to 18 years old. The mean I.Q. for the group was 107.0.

Tests Used

SRA Reading Index

Author: Science Research Associates, Inc.
259 East Erie Street
Chicago, Illinois 60611
Copyright 1970

Reading Progress Scale

Author: Ronald P. Carver
Revrac Publications
Silver Spring, Maryland 20910
Copyright 1971

The Henmon-Nelson Tests of Mental Ability

revised by: Tom A. Lamke and M. J. Nelson
Houghton Mifflin Company
Copyright 1957

In order to study the relationship between ability to recover deep structure and reading comprehension, the SRA Reading Index and Carver's Reading Progress Scale were used; I.Q. information was based on scores on the Henmon Nelson Test of General Ability, which was administered to all students as part of the regular school program.

The tests were administered to all juniors during their English classes. Both tests were administered during one fifty minute period on an untimed basis. Time spent on the Reading Progress Scale ranged from five to twenty-five minutes, and from ten to twenty-five minutes on the SRA Reading Index. All juniors who were present were tested by the writer over a period of three days, Friday, February 22, Monday, February 25, and Tuesday, February 26, 1974. In two cases, two English classes were combined for the purpose of administering the tests. The testing was preceded by brief remarks about the purpose of the study and an expression of appreciation for cooperation on the part of the students. The directions which appear on the Directions Sheet of the Reading Progress Scale and those which appear at the beginning of the SRA Reading Index were read aloud to each group before beginning the tests, and sample problems were completed.

Both tests were administered to two groups of fifty seventh grade students at the Hillsborough School, a junior high school in the Hillsborough school district. The group of one hundred students was chosen by the Guidance Department of the school to represent a cross section of the whole class in terms of ability. The two tests were administered by the writer, allowing seven minutes for completion of the Reading Progress Scale,

as suggested by the author, and allowing the students to finish the SRA Reading Index at their own speed, as recommended in the test manual. The tests were administered on March 11, 1974. As with the eleventh grade group, testing was preceded by brief remarks about the purpose of the study and an expression of appreciation; the directions were read aloud and sample problems were completed before each test.

Descriptions and Reviews of Tests

SRA Reading Index

This test is designed to measure very basic reading skills and the authors suggest that it may be used to determine whether or not job applicants for positions which demand little or no reading possess the necessary skills, such as reading position signs on machine equipment, posted signs or directions, written materials on containers, instructions in manuals, catalogs, or on forms. The test is divided into five sections, each designed to measure a distinct level of development. The subtests are: Picture-word association, Word decoding, Comprehension of phrases, Comprehension of sentences, and Comprehension of paragraphs. The authors indicate that the score for an individual taking the test is the

highest developmental level passed. The test manual includes a chart which indicates the number of correct answers needed to pass. "These numbers are based on an a priori proficiency criterion of 80% correct. Such a proficiency criterion demands that the examinee answer correctly at least 50% of the items in a section above what he might be expected to answer by chance" (The Reading and Arithmetic Indexes, Preliminary Manual, SRA, Inc., p. 7).

For the purposes of this study, the Sentence Comprehension Subtest of the SRA Reading Index will be considered a measure of a student's ability to recover deep structure. The concept of deep structure is essential to Chomsky's Theory of Syntax:

> The syntactic component of a grammar must specify, for each sentence, a deep structure that determines its semantic interpretation and a surface structure which determines its phonetic interpretation. . . . The central idea of transformational grammar is that they are, in general, distinct and that the surface structure is determined by repeated application of certain formal operations called "grammatical transformations" to objects of a more elementary sort. If this is true (as I assume, henceforth), then the syntactic component must generate deep and surface structures, for each sentence, and must interrelate them (Chomsky, 1965).

In this section of the test, the student is given a sentence to read, and asked to choose which of four other sentences has the same meaning.

Sample Item #40

The safest place to be during a tornado is in a storm cellar.

This sentence means the same as:

a. Storm cellars are like tornadoes in safe places.

b. Tornadoes storm cellars if it wants to be safe.

c. Storm cellars are the safest places to be during tornadoes.

d. During a tornado, the safest place to be is in a storm.

"Language has two levels; surface structure--sounds or written representation of language; and deep structure--meaning; related in a complex way through a system of rules that is grammar or syntax" (Smith and Goodman, 1971). What the student is doing in this section of the test is determining which of the sentences have the same deep structure or meaning, regardless of the differences in surface structure, or the observed grammatical relationships among the words of a sentence.

Test Development

A large number of items were originally developed for each level of the SRA Reading Index and submitted to the language department of a Job Corps center to be evaluated on the basis of language, content, and cultural bias.

After questionable items were revised or eliminated, 186 items were divided into three experimental forms which each contained a set of common items to be used in statistically evaluating the unique items of each form. The forms were then administered to a total of 675 male and female students from special and adult education programs in Colorado and South Carolina. Students also took the SRA Pictorial Reasoning Test (PRT). Subscores for each section of the test were obtained, and these, as well as the total scores were correlated with each item. According to the authors, items for the final form were selected to (1) maximize homogeneity, or internal consistency, within level; (2) minimize overlap or correlation between levels; and (3) minimize correlations between items and general ability as measured by the PRT (the maximum correlation accepted between item and PRT score was .40).

Reliability

The final form of the Reading Index was administered to 87 male and female enrollees in a basic education/on job training program in Chicago. The age range was 17 to 30. The split half reliability coefficient (K-R 20) based on data from this group was .87. The Raju-Guttman Index of Homogeneity, a statistic which measures whether or not a subject who passes a certain item can be presumed to have passed previous items, was computed to be .93.

Test Intercorrelations

Correlations between the SRA Reading and Arithmetic Indexes and the SRA Pictorial Reasoning Test were computed to determine if the indexes were yielding scores independent of general ability. Among the trainees whose scores are reported in the manual, proficiency in reading and arithmetic are more highly correlated with each other ($r = .46$) than either is correlated with scores on the PRT ($r = .229$ for reading and .227 for arithmetic).

Review

Adkins (Buros, 1972) felt that the test items were adequately edited, pretested, and analyzed with respect to internal criteria and difficulty. She felt, based on the total score, that the reading measure was too easy for the selected group. She raises the question of whether a test which correlates .15 to .25 with other measures of required skills should be considered a criterion for determining whether students are below, at, or above the potential required. Her final comment was that the burden of proof of validity rests on the user of the test.

Reading Progress Scale

This test consists of four paragraphs and reading input performance (the process of decoding and understanding the graphic symbols contained in reading material) is measured by a modified cloze technique. In each passage of approximately 100 words, every fifth word is deleted and the student is instructed to choose from two possible choices the word which belongs in that place in the sentence. A score of at least 90% on each paragraph is required to demonstrate the capability of reading the paragraph. Individuals receive scores of 0, 1, 2, 3, or 4, representing the number of paragraphs he was able to read, and corresponding to the highest level of material difficulty that the student can read, grade levels 1-3, 4-6, 7-9, or 10-12. For the purposes of this study, the raw score, or number of items which a student answers correctly, will be used in order to arrive at a more accurate correlation. It is not a norm referenced test designed to discriminate between individuals, but a type of criterion reference test designed to determine the difficulty level of reading material which a student can handle.

This test was selected because of the high correlation between traditional reading comprehension measures and cloze tests, and the fact that the latter technique

eliminates many problems associated with multiple choice question reading comprehension tests, such as the difficulty of the questions, and the effect of previous knowledge about the subject matter (Bormuth, 1967).

It was particularly important in terms of this study to eliminate some of the problems which a traditional reading comprehension test might cause in comparison with a measure of ability to recover deep structure. For example, some multiple choice questions based on a reading passage can be answered correctly by noting a similarity between the surface structure of the question and the sentence in the paragraph where that information would be found. Thus a correct answer would seem to indicate that the student has understood the meaning of the passage and the question, when that may not necessarily be the case.

On traditional reading comprehension tests, a student is frequently asked to draw conclusions or make inferences, an ability which approaches the concept of deep structure, whereas Carver's test does not ask the student to make inferences. The Reading Progress Scale is testing the student's ability to understand the actual reading material, not questions which are based on reading material.

Since the concept of deep structure and the process of reading comprehension are both concerned with meaning, and, to a certain extent, the interrelationships between words, it is to be expected that there will be some overlap on what the two measures are actually testing. It seems, however, that a cloze reading comprehension technique will minimize this overlap more than a traditional multiple choice reading comprehension test would.

Test Development

The paragraphs which make up the test were chosen from the 330 paragraphs studied by Bormuth in 1969. He categorized the paragraphs of approximately 100 words in length according to subject matter and grade level range. The paragraphs used for the first form of the test were chosen from Area #2, Civics. Four paragraphs, with equal cloze difficulty score increments were chosen, one paragraph from each of the first four levels. After the four paragraphs had been chosen, test items were developed via a mechanical type of procedure. Subjective judgement of the test constructor entered into the selection of items only to veto 7 alternative wrong words of the 80 items which were evaluated in the pilot study. A directions sheet was pilot tested with the first form of the test,

and a second form was developed from another four Bormuth paragraphs from the Geography area, using the same procedures.

Validity

Ninety-four students in an ungraded school were given Form 2 of the RPS. The teachers were given copies of the intact paragraphs and asked to predict the scores they felt their students would achieve on the test (0 - 4). With a 5 minute time limit, Form 2 had a 31% error rate (i.e. 31% of the 94 students failed a paragraph below the level the teacher had predicted). Form 5 was administered two days later with a 6 minute time limit, and the error rate dropped to 23% and some students were still answering items correctly when time was called. The time limit was increased to 7 minutes and the test was printed in final form and published. It was administered to a population of 471 3rd to 12th graders and the test reflects the progress by grades in school quite well.

Reliability

The relationship between teacher level rating and RPS level scores was studied for 191 3rd to 6th graders, and 471 3rd to 12th graders. The RPS level coincided

with or was one level higher than teacher rated level for 81% of students on Form 5 and 73% on Form 2. Only 4% on Form 5 and 5% on Form 2 of the students failed a paragraph at one level and passed the next highest level paragraph. The correlation between the two forms was .84; 64% of the students made exactly the same score on both forms, 33% differed by only one paragraph, and only 3% differed by as much as two paragraphs.

Statistical Design

The SRA Reading Index and the Reading Progress Scale were given to 218 eleventh grade students in Hillsborough High School and 100 seventh grade students in the Hillsborough School during the 1973-74 school year.

Mean raw scores were computed for the data from the eleventh grade sample.

The data for the seventh grade sample was processed at the Center for Computer and Information Services, Rutgers, The State University. The Program used was Statistical Package for the Social Sciences (SPSS), National Opinion Research Center, University of Chicago. Means, standard deviations and simple correlations were used to answer the questions about Reading Progress Scale scores and SRA Reading Index scores.

More specifically, Pearson's Product Moment Correlations were performed on the Reading Progress Scale

and the SRA Reading Index, the Reading Progress Scale and the Sentence Comprehension Subtest of the SRA Reading Index, the Reading Progress Scale and the Paragraph Comprehension Subtest of the SRA Reading Index. Both subtests were also correlated with each other and with the total score on the SRA Reading Index. The results of these computations are presented in Chapter 4.

CHAPTER 4

DATA AND FINDINGS

In order to determine the relationship between a student's ability to recover deep structure and his reading comprehension, Carver's Reading Progress Scale and the SRA Reading Index were administered to 218 eleventh grade students and 100 seventh grade students.

Eleventh Grade Sample

The raw scores for the eleventh grade population (N = 218) on the SRA Reading Index, the Sentence Comprehension section of the SRA Reading Index, and Carver's Reading Progress Scale constituted a narrow range of scores. The data was not suitable to attempt to answer the question of a relationship between a student's ability to recover deep structure and his reading comprehension on the basis of these two tests. Raw score means for subgroups according to ability grouping for English classes, and for the total group appear in Table 1. The total Reading Progress Scale Mean of 79.0 was derived from a raw score range of 50 to 80 out of a possible 80 points. The total SRA Reading Index mean of 56.5 was derived

TABLE 1

READING PROGRESS SCALE, SRA READING INDEX, SENTENCE COMPREHENSION SUBTEST, PARAGRAPH COMPREHENSION SUBTEST FOR GRADE 11 SAMPLE (N = 218)
MEAN RAW SCORES

Class	RPS	SRA	SC	PC
Enriched	79.5	58.5	11.9	13.7
College Prep	79.0	57.0	11.6	11.0
General	78.6	53.0	10.5	8.6
Heterogeneous	79.0	56.0	11.5	10.4
Total	79.0	56.4	11.5	10.9

from a raw score range of 37 to 60 out of a possible 60 points. The Sentence Comprehension subtest mean of 11.5 was derived from a raw score range of 6 to 12 out of a possible 12 points.

The subgroups of the sample represent the three ability groups into which students are divided for their English classes in order of descending ability: Enriched, College Preparatory, and General. The fourth subgroup, Heterogeneous, represents those students who are participating in one of two special English programs in which the students are of mixed abilities.

The fact that Carver's Reading Progress Scale was administered on an untimed basis undoubtedly contributed to the very high scores. The fact, though, that only 19 of 218 eleventh grade students were unable to achieve a score indicative of their ability to read material on a grade 10-12 level implies that the material was too easy for this group. It was observed during the administration and correction of the tests that students who spent the maximum time answering the test questions did not necessarily achieve the lowest scores. The amount of time spent answering the test questions did not seem to be directly related to a student's score on either test.

The high scores on the SRA Reading Index also indicate that the material presented was too easy for

this eleventh grade group. For the most part, the student made only chance errors on the first two sections of the test: Picture Word Association and Word Decoding. The number of errors increased slightly on the Sentence Comprehension section, and the students seemed to particularly enjoy this section of the test. Some were visibly amused by the sentences offered as choices of answers. The greatest number of errors occurred on the Paragraph Comprehension section, although these were minimal also.

The test scores did not differentiate between students sufficiently to answer question two which deals with the correlations between the two scores and the student's ability grouping.

Seventh Grade Sample

The raw scores for the seventh grade population (N = 100) on the SRA Reading Index, the Sentence Comprehension section of the SRA Reading Index, the Paragraph Comprehension section of the SRA Reading Index, and Carver's Reading Progress Scale covered a much greater range than the eleventh grade sample. Raw score means for these tests appear in Table 2.

The Reading Progress Scale was administered to the students on a timed basis, allowing seven minutes for the completion of the entire test which consists of four

TABLE 2

READING PROGRESS SCALE, SRA READING INDEX, SENTENCE COMPREHENSION SUBTEST, PARAGRAPH COMPREHENSION SUBTEST FOR GRADE 7 SAMPLE (N = 100) MEAN RAW SCORES AND STANDARD DEVIATIONS

Measures	Means	SD
Reading Progress Scale	52.9	13.8
SRA Reading Index	52.0	6.5
Sentence Comprehension	10.2	2.1
Paragraph Comprehension	8.6	3.0

paragraphs, each of which requires twenty responses. Although the scores cover a greater range, partially due to the fact that the students were allowed a limited time, it seems particularly important to point out that most of the students were still answering correctly when time was called. With the exception of approximately five of the lowest scores, essentially all scores represent the total number of items completed less a few chance errors.

It seems that this test served as a speed test rather than a power test of reading comprehension in this study. Although a moderate positive correlation was determined between the scores on the Reading Progress Scale and the Sentence Comprehension subtest of the SRA Reading Index, it does not seem possible to answer the question of the relationship between a student's ability to recover deep structure and his reading comprehension on the basis of this information alone.

Comparison of Test Scores

Data from the Reading Progress Scale and the SRA Reading Index for the seventh grade sample were processed at the Rutgers Center for Computer and Information Services.

Means and standard deviations for the raw scores of the total group appear in Table 2. The Reading Progress

Scale mean of 52.9 was derived from a raw score range of 11 to 80 out of a possible 80 points. The SRA Reading Index mean of 52.0 was derived from a raw score range of 21 to 60 out of a possible 60 points. The Sentence Comprehension subtest mean of 10.2 was derived from a raw score range of 3 to 12 out of a possible 12 points. The Paragraph Comprehension subtest mean of 8.6 was derived from a raw score range of 0 to 12 out of a possible 13 points.

Some relationships between the Reading Progress Scale and the SRA Reading Index and the two subtests appear in the correlation matrix in Table 3. All correlations were significant at the .01 level.

The major question of this study--Is there a significant positive correlation between a student's score on the Sentence Comprehension subtest of the SRA Reading Index and his score on Carver's Reading Progress Scale?--can be answered affirmatively. This result was somewhat predictable, as was pointed out in Chapter 1, since we are comparing a score on a reading test with the score on a subtest of another reading test. It was also noted that in this administration of the Reading Progress Scale, the measure seemed to serve as a speed test rather than a power test. This assumption is based on the fact that most students in the seventh grade sample were still answering questions correctly when time was called.

TABLE 3

READING PROGRESS SCALE, SRA READING INDEX, SENTENCE COMPREHENSION SUBTEST, PARAGRAPH COMPREHENSION SUBTEST FOR GRADE 7 SAMPLE (N = 100) CORRELATION MATRIX

Measures	RPS	SRA	SC	PC
Reading Progress Scale				
SRA Reading Index	.52*			
Sentence Comprehension	.43*	.81*		
Paragraph Comprehension	.51*	.83*	.57*	

*Significant at .01 level.

The Paragraph Comprehension Subtest of the SRA Reading Index is comparable to traditional multiple choice reading tests. It presents the student with a paragraph to read and then asks multiple choice questions based on the information presented in that paragraph. It may also be considered a measure of the reading comprehension process; the correlation between the Paragraph Comprehension Subtest and the Sentence Comprehension Subtest was also positive and significant at the .01 level. These two measures, however, are both subtests of the SRA Reading Index, and this may have affected the correlation.

Another possibility which must be considered is that the Sentence Comprehension Subtest and the other measures of reading comprehension are measuring a common language ability factor which produces a higher correlation between the two measures.

The mean raw score of 10.2 out of a possible 12 points on the Sentence Comprehension Subtest can be compared with the mean raw score of 8.6 out of a possible 13 points on the Paragraph Comprehension Subtest. Although these two subtests correlate at a significant level, the difference in the mean raw scores points to the possibility that there is a more demanding or refined skill or ability which the student must bring to the total reading comprehension process that may not be required in the

task of recovering the deep structure of a single sentence. Perhaps the positive correlation between these two scores can be interpreted as an indication that the ability to recover the deep structure of a single sentence is a prerequisite to the more complex process of comprehending the relationships between sentences presented in paragraph form.

Differences in Correlations According to Ability Groups

The second question--Is there a difference between ability groups students have been placed in for their English classes according to correlations between scores?--cannot be answered on the basis of this data. The scores on the Reading Progress Scale and the SRA Reading Index did not discriminate sufficiently to consider this question for the eleventh grade sample. Information about the ability grouping of the seventh graders was not available, so this question could not be considered for the seventh grade sample either.

The third question--Are there differences in the correlations between Sentence Comprehension scores and Reading Progress scores for the better readers and the poorer readers?--was answered on the basis of the data from the seventh grade sample. Since the Reading Progress Scale functioned as a test of reading speed in this study,

the categories of better readers and poorer readers were established on the basis of total scores on the SRA Reading Index. Those students whose scores fell into the top one-third of the sample were considered better readers, and those students whose scores fell into the bottom one-third of the sample were considered poorer readers.

Coefficients of correlation between score on the reading Progress Scale and the Sentence Comprehension Subtest of the SRA Reading Index were computed for the better readers and for the poorer readers according to Pearson's Product Moment Correlation. The correlation coefficient was .17 for the better readers, and .64 for the poorer readers. The correlation was significantly higher for the poorer readers.*

Comparison of Findings

The raw mean score for 100 seventh graders on the Sentence Comprehension Subtest of the SRA Reading Index was 10.2 out of a possible 13 points. This subtest is considered a measure of a student's ability to recover deep structure for the purposes of this study. The relatively high mean score is probably influenced by the fact that most of the sentences which were presented to the students were structurally fairly simple.

*Dixon, Wilfrid J. and Massey, Frank J. Introduction to Statistical Analysis. New York: McGraw Hill, 1957. Table A-30a, Percentiles of the Distribution of r when p=0, p. 468.

Hunt (1970) suggests that longer sentences are usually more difficult to read. He does not attribute this to the length of the sentence alone, but because longer clauses are usually indicative of more transformations which have been performed on the kernel sentence. Perhaps if the students were presented with more complex sentences, it would be a truer test of their ability to recover deep structure, and the mean score may have been lower.

Ohaver (1971) found a difference in comprehension scores of a group of slow readers based on the use of the recovery of deep structure. The students who were attempting to extract the meaning of the material through recovery of deep structure achieved higher scores than their counterparts who were not dealing with deep structure as a part of the reading process. The findings of this study would seem to support the idea that more proficient readers recover deep structure as part of the reading process by the significant correlations which were obtained. There was a positive significant correlation between the Sentence Comprehension Subtest, which is considered a measure of ability to recover deep structure, and the two measures of the reading comprehension process, the Reading Progress Scale and the Paragraph Comprehension subtest.

O'Donnell conducted two studies which dealt with the question of the relationship between grammatical structural awareness and reading comprehension. In the first one (1962), he found a more significant correlation between those two factors than between reading comprehension and knowledge of traditional grammar. He did not feel, however, that the correlation was high enough to justify the teaching of grammar as a means of improving reading comprehension. When the study was repeated on a different population, he found no significant relationship between knowledge of grammar and reading ability (1963).

The results of this study also establish a relationship between deep structure and reading ability, and seem to indicate a connection between reading ability and knowledge of grammar.

Simons (1970) conducted a study which examined the relationships between various factors, including deep structure, and the reading comprehension process of fifth grade students. His Deep Structure Recovery Test is quite similar in form to the Sentence Comprehension Subtest of the SRA Reading Index, but it is geared to a fifth grade level. Of the following factors, I.Q., word knowledge, word recognition skills, and ability to recover deep

structure, Simons found the deep structure ability to be the most significant factor affecting reading comprehension.

Although this study did not consider other factors, a positive relationship was established between the ability to recover deep structure and the reading comprehension process.

The positive significant correlation between the Reading Progress Scale and the Sentence Comprehension Subtest, and the Paragraph Comprehension Subtest and the Sentence Comprehension Subtest support the idea of a relationship between a student's ability to recover deep structure and reading comprehension. The implications of this relationship must be determined in the light of the fact that the Reading Progress Scale was not well suited to the purposes of this study, all tests administered during the course of the study may be measuring a common language ability factor which would affect the correlations, and the reading material upon which the students were tested may have been too easy for some of them.

A brief summary of some of the factors affecting a relationship between the ability to recover deep structure and reading comprehension, conclusions which can be drawn from the study, and suggestions for further research are presented in Chapter 5.

CHAPTER 5

SUMMARY AND CONCLUSIONS

The purpose of this study was to investigate the relationship between a student's ability to recover deep structure, as measured by his score on the Sentence Comprehension Subtest of the SRA Reading Index, and his reading comprehension, as measured by the Reading Progress Scale. All eleventh grade students in Hillsborough High School, Belle Mead, New Jersey, present on testing days were administered the Reading Progress Scale and the SRA Reading Index in February, 1974. The scores which were obtained did not constitute a sufficient range of data with which to answer the questions posed in the study. The mean raw scores were computed, but no further calculations were performed on this data.

The same tests were administered to a group of 100 seventh graders in the Hillsborough School, Belle Mead, New Jersey in March, 1974. This sample produced a range of scores which was adequate to attempt to answer the questions posed in the study.

Raw scores were processed at the Center for Computer and Information Services, Rutgers, The State

University, using the Statistical Package for the Social Sciences (SPSS), National Opinion Research Center, University of Chicago. Means, standard deviations, and correlation coefficients were obtained.

The correlation coefficient of the Reading Progress Scale with the Sentence Comprehension Subtest of the SRA Reading Index was .43, significant at the .01 level of confidence. All of the correlations performed were positive and significant.

The correlation between the Reading Progress Scale and the Sentence Comprehension Subtest of the SRA Reading Index was significantly higher for the poorer readers than for the better readers. Those two categories were established as the top one third scorers and the bottom one third scorers on the SRA Reading Index. The lower correlation for the better readers can partially be explained by the fact that most of these students got very high scores on the Sentence Comprehension Subtest, but their scores on the Reading Progress Scale covered a wider range. The Reading Progress Scale seemed to function as a speed rather than a power test of reading comprehension in this study. Therefore, these correlations are not really meaningful for comparing better and poorer readers in terms of relationship between ability to recover deep structure and reading comprehension.

The conclusion that there is a positive relationship between deep structure recovery and reading comprehension is in agreement with similar studies (Ohaver, 1971; Simons, 1970).

The conclusions reached from the data in the present study are:

1. There is a significant statistical relationship between a student's score on the Sentence Comprehension Subtest of the SRA Reading Index and his score on the Reading Progress Scale.

2. There is a relationship between a student's ability to recover deep structure and his reading comprehension.

3. The positive significant relationship between these two factors must be evaluated in the light of the fact that there is typically a high correlation among all tests which are measuring verbal ability skills.

4. There is a relationship between a student's knowledge of certain grammatical factors and his reading comprehension. A student's reading ability may be improved by increasing his knowledge of grammar.

Need for Further Research

1. The Reading Progress Scale seems to require further investigation to determine if the material pre-

sented is too easy for the average seventh or eleventh grade student. It also should be investigated as a power test and as a speed test of reading comprehension.

2. There is a need for an instrument which would test a student's ability to recover deep structure on more complex sentences than those which are found in the Sentence Comprehension Subtest of the SRA Reading Index.

3. There is a need for an instrument which tests a student's ability to recover deep structure of material presented in larger units than a single sentence.

4. It is suggested that the positive relationship between a student's ability to recover deep structure and his reading comprehension be further investigated at different grade levels and with larger populations.

5. It is suggested that the relationship between reading comprehension and instruction in transformational grammar be investigated by means of an experimental group, which would receive transformational grammar instruction, and a control group which would receive no formal grammatical instruction. Pre and post tests would be used to measure the effects on reading comprehension.

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APPENDIX: TESTS

The Reading Progress Scale and the SRA Reading Index are omitted due to copyright restrictions.

ABSTRACT

The purpose of this study was to investigate the relationship between a student's ability to recover deep structure, as measured by the Sentence Comprehension Subtest of the SRA Reading Index, and his reading comprehension, as measured by the Reading Progress Scale.

All eleventh grade students in Hillsborough High School, Belle Mead, New Jersey, present on test days were administered the Reading Progress Scale and the SRA Reading Index. The results were inadequate to answer the questions posed in the study. Mean raw scores were computed for the sample (N = 218) but no further computations were performed.

The two tests were then administered to a group of 100 seventh graders in the Hillsborough School, Belle Mead, New Jersey. Means, standard deviations, and intercorrelations were computed for the Reading Progress Scale, the SRA Reading Index, the Sentence Comprehension and Paragraph Comprehension Subtests of the SRA Reading Index.

All correlations were significant at the .01 level. A positive correlation between deep structure recovery and reading comprehension was established on the basis of these tests. The results seem to indicate that there is a relationship between a student's functional grammatical knowledge and his reading comprehension.

COURSE WORK FOR MASTER'S DEGREE IN READING

		Instructor
Fall, 1971-1972		
Guid. 502	Vocational Guidance Rider College, Trenton, N.J.	Mr. DeEsch
Spring, 1972		
299:561	Foundations of Reading Instruction	Dr. Kling
290:501	Introduction to Educational Tests and Measurements	Dr. Geyer
Summer, 1972		
299:564	Remedial Reading	Dr. Zelnick
299:565	Laboratory in Remedial Reading	Dr. Zelnick
Fall, 1972-1973		
290:540	Introduction to Learning	Dr. Montare Dr. Gilooly Dr. Cox
Spring, 1973		
290:514	Introduction to the Adolescent and Adult Years	Dr. Montare
Summer, 1973		
299:515	Teaching Reading Secondary, College, and Adult Students	Dr. Finn
610:522	Materials for Young Adults	Mr. DeMelle
Fall, 1973-1974		
299:566	Seminar in Reading Research and Supervision	Dr. Fry
Spring, 1974		
299:599	Thesis Research	Dr. Fry
290:518	Psychology of Personality	Dr. Shackleton

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Educational Background:

High School: Queen of the Rosary Academy
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June, 1965

College: Albertus Magnus College
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B.A., 1969

Professional Experience:

1970-1971 English teacher
Allentown High School
Allentown, New Jersey

1971-1972 English teacher

1972-1973 English, Reading, and Journalism teacher

1973-1974 English and Publications teacher
Hillsborough High School
Belle Mead, New Jersey